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G01N 1/31

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09/994,458 26 November 2001 (26.11.2001) US  
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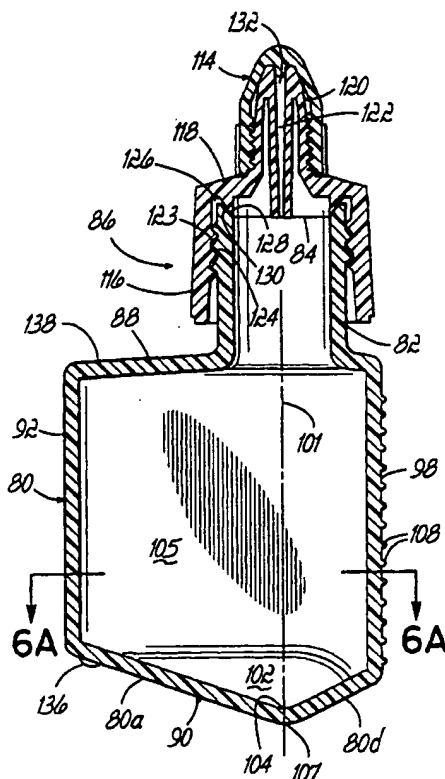
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(81) Designated States (*national*): AE, AG, AL, AM, AT, AU,  
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,  
CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE,  
SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ,  
VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,  
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: AUTOMATED TISSUE STAINING SYSTEM AND REAGENT CONTAINER



(57) Abstract: An automated staining system (10) and a reagent container (50) designed for use with the automated staining apparatus (10). The reagent container (50) includes a reagent containment section (80) capable of containing a volume of a reagent. The reagent containment section (80) includes an upper wall (88) and a base wall (90) that are spaced apart along an axis. The base wall (90) includes a well (102) having a nadir (104) that is aligned axially with an access opening in the upper wall (88) so that a reagent probe (38) entering the opening parallel to said axis will travel toward the nadir (104). In another aspect of the invention, the reagent container (50) may include a two-dimensional data element (140) containing reagent information. The staining apparatus (10) may include one removable drawer for holding reagent containers (50) and another removable drawer holding slides (12).



Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,  
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TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

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## INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 B65D23/00 G01N1/31

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65D G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 670 117 A (ERB HERMANN ET AL) 23 September 1997 (1997-09-23)	1-7
Y	column 1, line 39 - line 43 column 1, line 62 - line 67 column 3, line 2 - line 10; figures 2A,3	8-14
Y	US 5 839 091 A (CORL MARK V ET AL) 17 November 1998 (1998-11-17) cited in the application column 3, line 48 - line 49; figure 1B column 12, line 54 - column 13, line 57; figure 24	8-14
A	GB 2 216 259 A (MICROVOL LTD) 4 October 1989 (1989-10-04) page 5, paragraph 2 - paragraph 3 -/--	4-6, 11-13

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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- \*Z\* document member of the same patent family

Date of the actual completion of the international search

12 September 2003

Date of mailing of the international search report

10. 10. 2003

Name and mailing address of the ISA

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X	US 5 264 182 A (SAKAGAMI TOSHIO) 23 November 1993 (1993-11-23) column 5, line 22 - line 29; figure 2 ---	1,2
X	DE 94 00 010 U (POHL HJALTE ;HABER HORST DIPL ING FH (DE); SCHNEIDER JUERGEN (DE)) 24 February 1994 (1994-02-24) figure 1 ---	1,2
A	US 5 523 047 A (CORBY KENNETH D ET AL) 4 June 1996 (1996-06-04) figures 1-3 ---	1,7
A	EP 0 987 181 A (IVOCLAR AG) 22 March 2000 (2000-03-22) paragraph '0002! paragraph '0026! ---	1-7
A	US 5 417 121 A (HVIDTFELDT KRISTIAN J ET AL) 23 May 1995 (1995-05-23) column 9, line 15 - line 28; figure 3 ---	1,2
A	US 5 654 200 A (COPELAND KEITH G ET AL) 5 August 1997 (1997-08-05) column 9, line 47 - line 54; figure 14 column 12, line 27 - line 38; figure 15 ---	8
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Y		29-33
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A	US 5 573 727 A (KEEFE RAYMOND A) 12 November 1996 (1996-11-12) column 2, line 30 - line 53; figure 1 ---	20
A	US 5 482 839 A (MINAKAWA HIDETAKA ET AL) 9 January 1996 (1996-01-09) column 6, line 6 - line 11 column 6, line 37 - line 47 column 3, line 60 -column 4, line 14; figures 1-5 ---	20-25
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International Application No

US 02/37552

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A	US 3 912 456 A (YOUNG ROBERT R) 14 October 1975 (1975-10-14) column 3, line 43 - line 45; figure 1 column 7, line 3 - line 8; figure 3 -----	21
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A	EP 0 510 686 A (HITACHI LTD) 28 October 1992 (1992-10-28) column 9, line 56 - line 58; figure 4 -----	15

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-14

Reagent container and staining apparatus comprising a plurality of said reagent containers

2. Claims: 15-19, 26-28, 38-44

Staining apparatus with reagent containers carrying two-dimensional data storage elements and a robotic delivery system including a probe and an optical reader; method of staining including the reading of said two-dimensional data storage elements.

3. Claims: 20-25

staining apparatus with a drawer

4. Claims: 29-37

methods of operating a staining apparatus with a remote computer system

5. Claims: 45-53

staining method using a slide holding a tissue specimen and a two-dimensional data element and using an optical reader to decode the data element and to image the tissue specimen

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 02/37552

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

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Information on patent family members

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Information on patent family members

International Application No

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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		DE 69220714 T2	06-11-1997
		EP 0510686 A2	28-10-1992
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(72) Inventors: **TSEUNG, Ken, K.**; 4018 Allyson Terrace,  
Fremont, CA 94538 (US). **RHETT, Norman, K.**; 544

Santander, San Ramon, CA 94583 (US). **TAKAYAMA, Glenn, K.**; 240 Heather Place, Danville, CA 94526 (US). **WONG, Wai, Bun**; 3669 Dowitcher Terrace, Fremont, CA 94555 (US). **YUEN, Delia, P.**; 1052 West Hill Court, Cupertino, CA 95014 (US).

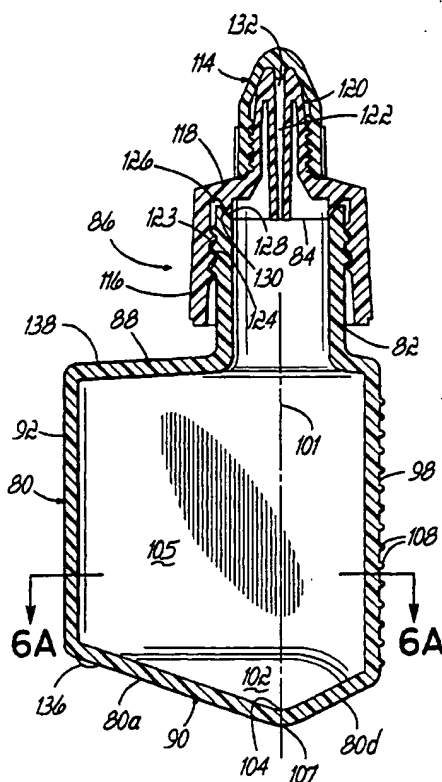
(74) Agents: **FREL, Donald, F.** et al.; Wood, Herron & Evans, L.L.P., 2700 Carew Tower, Cincinnati, OH 45202 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),

[Continued on next page]

(54) Title: **AUTOMATED TISSUE STAINING SYSTEM AND REAGENT CONTAINER**



(57) Abstract: An automated staining system (10) and a reagent container (50) designed for use with the automated staining apparatus (10). The reagent container (50) includes a reagent containment section (80) capable of containing a volume of a reagent. The reagent containment section (80) includes an upper wall (88) and a base wall (90) that are spaced apart along an axis. The base wall (90) includes a well (102) having a nadir (104) that is aligned axially with an access opening in the upper wall (88) so that a reagent probe (38) entering the opening parallel to said axis will travel toward the nadir (104). In another aspect of the invention, the reagent container (50) may include a two-dimensional data element (140) containing reagent information. The staining apparatus (10) may include one removable drawer for holding reagent containers (50) and another removable drawer holding slides (12).

WO 2003/045560 A3



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Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 670 117 A (ERB HERMANN ET AL) 23 September 1997 (1997-09-23)	1-7
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Date of the actual completion of the international search

12 September 2003

Date of mailing of the international search report

10. 10. 2003

Name and mailing address of the ISA

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Fax: (+31-70) 340-3016

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Staining apparatus with reagent containers carrying two-dimensional data storage elements and a robotic delivery system including a probe and an optical reader; method of staining including the reading of said two-dimensional data storage elements.

3. Claims: 20-25

staining apparatus with a drawer

4. Claims: 29-37

methods of operating a staining apparatus with a remote computer system

5. Claims: 45-53

staining method using a slide holding a tissue specimen and a two-dimensional data element and using an optical reader to decode the data element and to image the tissue specimen



# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 02/37552

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

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